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PETITION FEE
Under 37 CFR 1.17(f), (g) & (h)
TRANSMITTAL
(Fees are subject to annual revision)

Send completed form to: Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450

Application Number	**10/822,725**
Filing Date	**April 13, 2004**
First Named Inventor	**Sachiko HOSHINO et al.**
Art Unit	**2188**
Examiner Name	**M. Padmanabhan**
Attorney Docket Number	**1309.43768X00**

Enclosed is a petition filed under 37 CFR 1.102(d) that requires a processing fee (37 CFR 1.17(f), (g), or (h)). Payment of $ 130.00 is enclosed.

This form should be included with the above-mentioned petition and faxed or mailed to the Office using the appropriate Mail Stop (e.g., Mail Stop Petition), if applicable. For transmittal of processing fees under 37 CFR 1.17(i), see form PTO/SB/17i.

Payment of Fees (small entity amounts are NOT available for the petition (fees)

☒ The Commissioner is hereby authorized to charge the following fees to Deposit Account No. 50-1417:
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Petition Fees under 37 CFR 1.17(f): **Fee $400** **Fee Code 1462**
For petitions filed under:
§ 1.53(e) - to accord a filing date.
§ 1.57(a) - to according a filing date.
§ 1.182 – for decision on a question not specifically provided for.
§ 1.183 – to suspend the rules.
§ 1.378(e) for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in an expired patent.
§ 1.741(b) – to accord a filing date to an application under §1.740 for extension of a patent term.

Petition Fees under 37 CFR 1.17(g): **Fee $200** **Fee code 1463**
For petitions filed under:
§1.12 - for access to an assignment record.
§1.14 - for access to an application.
§1.47 - for filing by other than all the inventors or a person not the inventor.
§1.59 - for expungement of information.
§1.103(a) - to suspend action in an application.
§1.136(b) - for review of a request for extension of time when the provisions of section 1.136(a) are not available.
§1.295 - for review of refusal to publish a statutory invention registration.
§1.296 - to withdraw a request for publication of a statutory invention registration filed on or after the date the notice of intent to publish issued.
§1.377 – for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of a patent.
§1.550(c) – for patent owner requests for extension of time in ex parte reexamination proceedings.
§1.956 – for patent owner requests for extension of time in inter partes reexamination proceedings.
§ 5.12 – for expedited handling of a foreign filing license.
§ 5.15 – for changing the scope of a license.
§ 5.25 – for retroactive license.

Petition Fees under 37 CFR 1.17(h): **Fee $130** **Fee Code 1464**
For petitions filed under:
§1.19(g) – to request documents in a form other than that provided in this part.
§1.84 – for accepting color drawings or photographs.
§1.91 – for entry of a model or exhibit.
§1.102(d) – to make an application special.
§1.138(c) – to expressly abandon an application to avoid publication.
§1.313 – to withdraw an application from issue.
§1.314 – to defer issuance of a patent.

Name (Print/Type)	**Frederick D. Bailey**	*Registration No. (Attorney/Agent)*	**42,282**
Signature		*Date*	July 6, 2005

Docket No.: 1309.43768X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

Sachiko HOSHINO et al.

Serial No. 10/822,725

Filed: April 13, 2004

For: STORAGE SUBSYSTEM AND STORAGE SUBSYSTEM CONTROL METHOD

Group: 3188

Examiner: M. Padmanabhan

PETITION TO MAKE SPECIAL
UNDER 37 CFR §1.102(MPEP §708.02)

July 6, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby petition the Commissioner to make the above-identified application special in accordance with 37 CFR §1.102(d). Pursuant to MPEP §708.02(VIII), Applicants state the following.

(A) This Petition is accompanied by the fee set forth in 37 CFR §1.17(h).

The Commissioner is hereby authorized to charge any additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

(B) All claims are directed to a single invention.

If the Office determines that all claims are not directed to a single invention, Applicant will make an election without traverse as a prerequisite to the grant of special status in conformity with established telephone restriction practice.

(C) A pre-examination search has been conducted.

The search was directed towards a storage system. The search was directed to the invention set forth in claims 1-10. The invention is directed to, at a minimum, a storage subsystem, that includes: a plurality of channel adapters that each control the exchange of data with a host device; a plurality of storage device groups that each provide a logical storage region; a plurality of disk adapters that each control the exchange of data with each of the storage device groups; a cache memory that is used by each of the channel adapters and each of the disk adapters; a plurality of cache partition regions constituted by logically partitioning the cache memory; and a control memory that stores management information for managing each of the cache partition regions, wherein the management information is constituted by partition management information items provided in each of the cache partition regions, and common management information that is applied to all of the cache partition regions.

The search of the above features was conducted in the following areas:

Class	Subclass
707	200-204
709	203, 213
711	111-114, 129, 151-154, 161-165, 171, 173
714	5-7

Additionally, a computer database search was conducted on the USPTO system EAST.

(D) The following is a list of the references deemed most closely related to the subject matter encompassed by the claims:

U.S. Patent Number	Inventors
6,148,368	DeKoning
6,341,331	McNutt
6,347,358	Kuwata

U.S. Patent Publication No.	Inventor(s)
2003/0196055	Kamano et al.
2004/0111557	Nakatani et al.
2004/0139168	Tanaka et al.
2004/0193803	Mogi et al.

A copy of each of these references (as well as other references uncovered during the search) is enclosed in an accompanying IDS.

(E) It is submitted that the present invention is patentable over the references for the following reasons.

It is submitted that the cited references, whether taken individually or in combination with each other, fail to teach or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to teach or suggest in combination with the other limitations recited in the claims:

a first feature of the present invention as recited in independent claim 1 wherein a plurality of channel adapters that each control the exchange of data with a host

device, a plurality of storage device groups that each provide a logical storage region, a plurality of disk adapters that each control the exchange of data with each of the storage device groups, a cache memory that is used by each of the channel adapters and each of the disk adapters, a plurality of cache partition regions constituted by logically partitioning the cache memory, and a control memory that stores management information for managing each of the cache partition regions, wherein the management information is constituted by partition management information items provided in each of the cache partition regions, and common management information that is applied to all of the cache partition regions; and

a second feature of the present invention as recited in independent claim 10 including partitioning a cache region provided by the memory section into a plurality of cache partition regions, partitioning management information for each of the cache partition regions in accordance with the attribute of a cache management unit for managing data in the memory section, and managing data in each of the cache partition regions on the basis of each of the management information items.

The references considered most closely related to the claimed invention are briefly discussed below:

U.S. Patent 6,148,368 (DeKoning) discloses a disk array storage system and a method for extending the effective size of a controller cache memory to improve the write performance of the subsystem. The disk array comprises a plurality of storage elements, such as disk drives. A cache-extension disk region and a main disk region are each areas of storage distributed across the plurality of disk drives of the disk array. Collectively, the cache-extension disk region and a partitioned cache memory are referred to as an extended cache memory. The main disk region is the remainder of the

storage in the disk drives of the disk array. Persistent data storage is managed in accordance with RAID storage management techniques in the main disk region. Write data received from the host computer request is usually temporarily stored in the extended cache memory so that the host I/O write request may be completed without the need to wait for mechanical delays of disk drives. Data read from the disk drives is usually saved for successive reads in standard cache segments of segmented cache memory. (See, e.g., Abstract, column 7, lines 8-25, and Figure 2.) However, unlike the present invention, DeKoning does not disclose, at a minimum, a plurality of channel adapters that each control the exchange of data with a host device, a plurality of storage device groups that each provide a logical storage region, and a plurality of disk adapters that each control the exchange of data with each of the storage device groups. More particularly, DeKoning does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims.

U.S. Patent 6,341,331 (McNutt) discloses a storage system that has a storage device, such as a disk storage device, and a cache memory. The cache memory is logically partitioned into a segment cache and a group cache. Data of a small granular nature (a "segment") is stored in the segment cache. Data of a larger granular nature (a "group") is stored in the group cache. The cache memory includes a multi-granular manager. The manager logically partitions cache memory into a first cache and a second cache. The manager responds to data access requests from the host computer to cause data structures of smaller granularity, such as segments, to be stored in the first cache. The manager responds to data access requests from host computer to

cause data structures of a higher granularity, such as groups, to be stored in the second cache. The first and second caches may be designated physical areas of a cache memory or may be logical areas. (See, e.g., Abstract and column 4, lines 24 - 36.) However, unlike the present invention, McNutt does not disclose, at a minimum, a plurality of channel adapters that each control the exchange of data with a host device, a plurality of storage device groups that each provide a logical storage region, and a plurality of disk adapters that each control the exchange of data with each of the storage device groups. More particularly, McNutt does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims.

U.S. Patent 6,347,358 (Kuwata) discloses a disk control unit which improves the use of a cache in a disk unit to increase concurrent access speeds. The disk control unit comprises a plurality of directors, each independently controlling an I/O operation between a plurality of hosts and a disk unit, a cache memory connected to the directors and having a plurality of cache areas provided according to the configuration of the disk unit, and a plurality of cache management areas, each provided for each of the cache areas for keeping track of whether or not the cache area is used by any of the directors. In addition, the disk control unit has an exclusive control unit which allows each director to reference the cache management area to place the cache area under exclusive control. (See, e.g., Abstract and column 2, lines 44-63, and Figure 1.) However, unlike the present invention, Kuwata does not disclose, at a minimum, a plurality of channel adapters that each control the exchange of data with a host device, a plurality of storage device groups that each provide a logical storage region, and a plurality of disk adapters

that each control the exchange of data with each of the storage device groups. More particularly, Kuwata does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2003/0196055 (Kamano et al.) discloses a storage system capable of acquiring information that uniquely identifies the connected host computers and automatically registers it within a storage controller, thereby making it possible to either permit or reject access to storage regions under command of the storage controller. The storage system includes: a storage controller that is constructed by a front end control unit (channel adapter) for controlling the fiber channel protocol to the host computers, a microprocessor for controlling the storage controller; a nonvolatile control memory for storing a microprogram for controlling the operation of storage controller; a cache for temporarily storing data; a cache control unit for controlling this cache to read and write data; a back end control unit (disk adapter) for controlling a protocol used by the magnetic disk drives to control data transfer to or from the magnetic disk drives; and a panel on which information is set. (See, e.g., Abstract, paragraphs 26 and 27, and Figure 1.) However, unlike the present invention, Kamano et al. does not disclose, at a minimum, a plurality of cache partition regions constituted by logically partitioning the cache memory. Furthermore, Kamano et al. does not disclose management information that is constituted by partition management information items provided in each of the cache partition regions, and common management information that is applied to all of the cache partition regions. More particularly, Kamano et al. does not disclose or suggest the above described first

feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2004/0111557 (Nakatani et al.) discloses a storage system that includes a journaling file system that stores the update history of files stored on a disk drive in a storage system to prepare against a server failure. The storage system includes: a disk controller that comprises a channel adapter that sends or receives data to or from the server; a cache memory in which data written by the server or data read from the disk drive is stored; a main memory in which the programs to be executed by a disk control processor are stored; a control memory in which control information used by controllers is stored; and a disk adapter that sends or receives data to or from the disk drive. (See, e.g., Abstract and paragraphs 23-26, and Figure 1.) However, unlike the present invention, Nakatani et al. does not disclose, at a minimum, a plurality of cache partition regions constituted by logically partitioning the cache memory. Furthermore, Nakatani et al. does not disclose management information that is constituted by partition management information items provided in each of the cache partition regions, and common management information that is applied to all of the cache partition regions. More particularly, Nakatani et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2004/0139168 (Tanaka et al.) discloses a storage system for storing data to be used by a user or an application. The storage system

includes: a disk cache used for temporarily storing data and speeding-up data read/writes; a control memory used for maintaining the integrity of data in the storage system and storing and sharing the system status; and a disk adapter for controlling a disk which stores data. The storage system has a channel adapter connected to a Fibre Channel interface of the host computer for performing a command and data process. (See, e.g., Abstract and paragraph 41.) However, unlike the present invention, Tanaka et al. does not disclose, at a minimum, a plurality of cache partition regions constituted by logically partitioning the cache memory. Furthermore, Tanaka et al. does not disclose management information that is constituted by partition management information items provided in each of the cache partition regions, and common management information that is applied to all of the cache partition regions. More particularly, Tanaka et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2004/0193803 (Mogi et al.) discloses a cache management system and method that enables optimal cache space settings to be provided on a storage device in a computer system where database management systems run. The storage space is divided into groups in units of the LUs, and separate space partitions within the data cache are allocated to the groups, called cache groups. The organization of the cache groups is retained in the form of cache group information included in the management information. Creating and deleting a cache group, and adding and deleting an LU to/from a cache group can be performed dynamically. The storage device also has a function of dynamically changing the space allocations of the

data cache to the cache groups. (See, e.g., Abstract and paragraphs 13-17 and 57.) However, unlike the present invention, Mogi et al. does not disclose, at a minimum, a plurality of channel adapters that each control the exchange of data with a host device; a plurality of storage device groups that each provide a logical storage region; a plurality of disk adapters that each control the exchange of data with each of the storage device groups. More particularly, Mogi et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims.

Therefore, since the cited references fail to disclose or suggest the above described first feature of the present invention as recited in independent claim 1 and the above described second feature of the present invention as recited in independent claim 10 in combination with the other limitations recited in each of the independent claims, it is submitted that all of the claims are patentable over the cited references whether said references are taken individually or in combination with each other.

(F) Conclusion

Applicant has conducted what it believes to be a reasonable search, but makes no representation that "better" or more relevant prior art does not exist. The United States Patent and Trademark Office is urged to conduct its own complete search of the prior art, and to thoroughly examine this application in view of the prior art cited herein and any other prior art that the United States Patent and Trademark Office may locate in its own independent search. Further, while Applicant has identified in good faith

certain portions of each of the references listed herein in order to provide the requisite detailed discussion of how the claimed subject matter is patentable over the references, the United States Patent and Trademark Office should not limit its review to the identified portions but rather, is urged to review and consider the entirety of each reference, and not to rely solely on the identified portions when examining this application.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

(G) Fee (37 C.F.R. 1.17(h))

The fee required by 37 C.F.R. § 1.17(i) is to be paid by:

[X] the Credit Card Payment Form (attached) for $130.00.

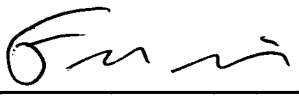
[ ] charging Account _____ the sum of $130.00.

A duplicate of this petition is attached.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (Atty. Docket No. 1309.43768X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



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